**Project 1 Design Document**

- Overall design -

**software:** [why did we make the choices we did? costs/benefits?]

**hardware:**

Part list:

Arduino with USB cable x1

Pushbutton x1

Jumper wires – various

Green LED x1

Yellow LED x1

LCD1602 Module x1

HC-SR04 Ultrasonic sensor x1

Servo Motor SG90 x1

fan blade w/ 3-6v DC motor x1

DHT11 Temp/humidity sensor x1

resistors: 220x1, 330x3

Diode x1

NPN Transistor PN2222x1

Inputs: start button, water temp, ultrasonic sensor, timer completion

Output: LED display (temp), timer display (30 to 0), washing-complete LED, fan, real time to comp (serial).

**Pins needed:**

Pushbutton: input

Green LED: output

Yellow LED: output

Fan motor: output - PWM

Servo motor: output (unsure if this needs PWM for rotation)

Temp sensor: output

Ultrasonic sensor: input, output

LCD: 6x inputs: register select, enable, and four data lines

Total projected: 14 pins, plus power and ground

Individual: personal challenges in the project, lessons learned, improvements for future projects.

Function maps:

**You may use the libraries provided with the kit for**

**\* the LCD**

**\* the real-time clock**

**\* the temp/humidity sensor**

**\* the motors**

**\* serial transmission over USB**

In all other cases, you should write the code from scratch and use register-level functions. For example, to light an LED, write to the correct register. Do NOT use the digitalWrite function from the library. The same applies for delay. If you need a delay, you should use your own function and not the built-in delay function.

**LINKS**

**https://github.com/cpe-unr/group-project-group81**

https://www.circuitbasics.com/how-to-set-up-the-dht11-humidity-sensor-on-an-arduino/